FIG.9(a)

### Electromechanical coupling factors (kp)

	~~	0.000	0.470	0.407	0.450	0.400
	20	0.092	0.170	0.187	0.150	0.160
	15	0.087	0.203	0.230	0.209	0.204
(mol%)						
Ě	10	0.151	0.292	0.307	0.292	0.283
ت	8	0.196	0.340	0.335	_0,313_	0.287
ニ	6	0.332	0.415	0.383	0.406	0.336
	4	0.371	0.456	0.501	0.431	0.382
	2	0.469	0.395	0.341	0.3801	0.330
	0 `	0.334	0.453	0,465	0.332	0.294
		0	- 10	20	30	40
				Ta (mol%)	•	

FIG.9(b)

## Piezoelectric constant (d31 pm/V)

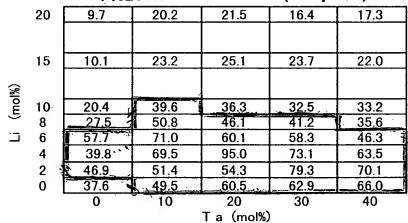
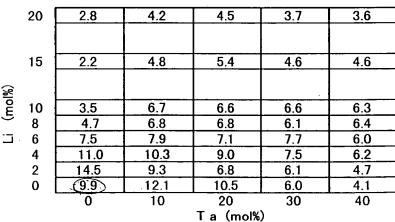


FIG.9(c)

## Piezoelectric constant (g31 10 <sup>3</sup>Vm/N)



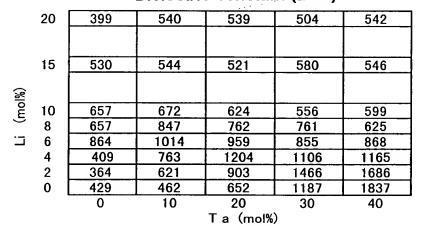
6

## Curie point (°C)

	20	505	459	390	347	295
	15	502	450	385	337	280
<b>%</b>			•			
(wow)	10	499	450	380	330	262
_	8	485	420	363	310	250
:	6	474	405	345	295	235
	4	460	393	337	279	220
	2	435	375	308	250	192
	0	415	350	285	233	168
		0	10	20	30	40
				Ta (mol%	)	

## FIG.10(b)

## Dielectric constant (E33t)



# FIG.10(C) Dielectric loss (tanδ)

			2,0.00		()	
	20	0.091	0.015	0.011	0.014	0.008
	15	0.045	0.022	0.007	0.007	0.008
	10	0.040	0.022	0.007	0.007	0.008
%						
(mol%)	10	0.088	0.039	0.007	0.007	0.008
	8	0.037 🜡	0.010	0.010	0.008	0.011
<u> </u>	6	0.050	0.008	0.006	0.009	0.011
	4 ()	0.014	0.014	0.008	0.006	0.014
	2	0.003	0.023	0.018	0.016	0.018
	0	0.036	_0.005	0.010	0.012	0.009
		0	10	20	30	40
				Ta (mol%)	)	

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Table 3

The results of the measurement of KNN-LT (one hour passed after the poling)

	A Sample of the	A Comparative
	invention	Sample
	Sample No. 2	Base sample
Sample name	KNN-LT	KNN
A composition formula	{ (Ko.sNao.s)o.sLio.1} (Nb <sub>0.8</sub> Ta <sub>0.2</sub> )O <sub>3</sub>	Ko.sNao.sNbOs
Measurement Item		
Relative density (%)	99.0	96.2
Piezoelectric	•	
properties		
Electromechanical	0.307	0.334
coupling factors (kp)		
Piezoelectric	36.3	37.6
constant (d31 pm/V)		
Piezoelectric	104	115
constant (d33 pm/V)		
Piezoelectric	6.57	9.90
constant		
(g31 10 <sup>-3</sup> Vm/N)		
Piezoelectric	11.9	30.3
constant		
(g33 10 <sup>-3</sup> Vm/N)		
Elastic properties		
Mechanical quality	273.4	100.6
factor (Qm)		
Dielectric property		
Dielectric constant	624	429
(E33t)		
Dielectric loss (tanδ)	0.0071	0.0356
Phase transition		
temperature		
Curie point (°C)	380	415
Phase transition	NONE	210
temperature		
(Ortho → Tetra)		
Temperature		
coefficient		
Dielectric constant	10	.93
(%/-50 to 100 °C)		
Resistivity (Ω·cm)	3.15E + 10	7.67E + 10

<sup>\*</sup> Properties improved by Li, Ta

Table 4

The results of the measurement of KNN-LT

(28 days passed after the poling) A Comparative A Sample of the Sample invention Base sample Sample No. 2 KNN KNN-LT Sample name Ko.5Nao.5NbO3 { (Ko.5Nao.5) 0.9Lio.1} A composition formula  $(Nb_{0.8}Ta_{0.2})O_3$ Measurement Item 96.2 99.0 Relative density (%) Piezoelectric properties 0.329 0.290 Electromechanical coupling factors (kp) 38.6 33.4 Piezoelectric constant (d31 pm/V) 115 104 Piezoelectric constant (d33 pm/V) 9.30 6.23 Piezoelectric constant  $(g31 \ 10^{-3} Vm/N)$ 30.3 11.6 Piezoelectric constant  $(g33 \ 10^{-3} Vm/N)$ Elastic properties 85.6 360.1 Mechanical quality factor (Qm) Dielectric property 470 606 Dielectric constant (E33t) 0.0890 Dielectric loss (tanδ) 0.0070 Phase transition temperature 415 380 Curie point (°C) 210 Phase transition NONE temperature (Ortho → Tetra) Temperature coefficient 93 Dielectric constant 10 (%/-50 to 100 °C) 7.67E + 103.15E + 10Resistivity  $(\Omega \cdot cm)$ 

<sup>\*</sup> Properties improved by Li, Ta